DEPARTMENT OF FISH AND GAME
NORTHERN CALIFORNIA-NORTH COAST REGION
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January 21, 2003

Mr. Dave Sabo, Area Manager
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Dear Mr. Sabo:

Transmittal of Errata Pages for the Report
"September 2002 Klamath River Fish Kill: Preliminary Analysis of Contributing Factors"

Attached are two errata sheets to replace pages 10 and 55 in the original subject report. The new Page 10 removes unimpaired flow values for September as presented in the original document and presents current annual water use values on the Scott and Shasta rivers. The California Department of Water Resources (CDWR) recently brought to our attention that the unimpaired flows for the Scott and Shasta rivers reported by the California Department of Fish and Game (CDFG) in the last paragraph on page 10 were actual gauged flows and did not include estimates of upstream agricultural, municipal and industrial water use.

The new Page 55 replaces a CDFG conclusion regarding the volume of flows that could be contributed by the Shasta and Scott rivers during September if there was no agricultural water use. While the average annual unimpaired flow contributions of the Shasta (1.5%) and Scott (3.6%) rivers to the total unimpaired Klamath River flow are accurate, the data in CDWR (1997) cannot be used to determine unimpaired flows on a monthly basis. Consequently, CDFG concludes that the Shasta and Scott rivers contribute less than six percent of the average annual unimpaired Klamath River flows and solutions to flow related fishery issues must be addressed from a basinwide perspective considering sources of water and regulation of releases from reservoirs.

If you have any questions regarding these corrections, please contact Habitat Conservation Program Manager Mark Stopher. He can be reached at the letterhead address or by telephone at (530) 225-2275.

Sincerely,

Donald Koch

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Regional Manager

cc: See pages two and three

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the 2002 fish kill. Discharges at Iron Gate Dam were greater in September 1994 (906 cfs) than in 2002 (760 cfs). Flows in the lower river near Klamath, however, were lower in 1994 (1,990 cfs) compared to 2002 (2,129 cfs). Discharges at Iron Gate Dam were 1,026 cfs in 2001 compared to 760 cfs for 2002, while September flows in the lower river were almost 500 cfs greater in 2001 than 2002.

While the KNK data shows similar or lower average flows in 1988, 1991, 1992, and 1994 compared to September 2002 (2002 data is provisional), these low flows occurred in only 8% of the years for the period of record since 1951. These low flow years mostly coincide with the prolonged drought of the early 1990s (Figure 2). In 92% of the years since 1951, average September flows were higher at KNK than during 2002. Prior to 1988, average September flows never approached the low level observed during 2002. Flow releases from Iron Gate Dam show a similar trend. Average September flow records for KIG were lower in 1973, 1991, and 1992 than those observed in 2002 (Figure 2). The KIG records show that in 93% of the years since 1961, flow releases from Iron Gate Dam were higher than the flows during the September 2002 fish kill.

There have been stakeholder concerns that the 2002 fish kill may have been related to high agricultural water diversions from the Shasta and Scott rivers, resulting in abnormally low flows in the lower Klamath River. The California Department of Water Resources (CDWR) has reconstructed estimates of the unimpaired flow contributions (natural flow that would occur if there were no dams or diversions) for various Klamath Basin drainages to the total Klamath River outflow (CDWR 1997). CDWR found that over a period of record from 1945 to 1994, the Shasta and Scott rivers if unimpaired would contribute 1.5% and 3.6%, respectively, of the total average annual flow to the Klamath River. In addition, CDWR estimates that current annual water use in the Shasta River and Scott River basins equal 110,000 acre-feet and 71,800 acre-feet, respectively. In comparison, average annual irrigation and urban water use above Keno Dam in Oregon totaled 503,700 acre-feet (CDWR 1997).

- Of the Steelhead killed, DFG estimates that 53% were naturally spawned fish and 47% were fish produced in one of the two mitigation hatcheries (Iron Gate or Trinity River hatcheries) in the Klamath River system.

- Only 13 coho salmon carcasses were directly examined by DFG, of which three were naturally spawned fish and ten were fish produced in one of the two mitigation hatcheries (Iron Gate or Trinity River hatcheries) in the Klamath River system.

- The cause of death for adult Chinook and coho salmon and steelhead during September 2002 was disease from the ciliated protozoan *Ichthyopthirius multifilis* (ICH) and the bacterial pathogen *Flavobacter columnare* (columnaris). Both pathogens commonly occur naturally worldwide and are always present in the Klamath River and other aquatic systems.

- Similar or lower average flows than during the September 2002 fish kill (2002 flow is provisional) have occurred in the lower Klamath River at Klamath during September 1988, 1991, 1992, and 1994. Most of these low flow years occurred during a prolonged drought in the early 1990s and are unusual conditions. When looking at the longer period of record since 1951, higher average September flows than in 2002 occurred in 92% of the years. Without looking at the long term flow records, it is inappropriate to use the drought years of the early 1990s to characterize "normal" flow conditions in the Klamath River.

- The Scott and Shasta rivers contribute less than six percent of the average annual unimpaired flows in the Klamath River. A solution to flow related fisheries problems in the Klamath System (Klamath and Trinity river systems and major tributaries) must be addressed at a basinwide level. Important considerations include sources of water and regulation of releases from reservoirs.

- Average September flow records for the Klamath River below Iron Gate Dam (KIG) were lower in 1973, 1991, and 1992 than those observed in 2002 (2002 flow is provisional). Similar to flow records from the lower Klamath River, KIG records show that in 93% of the years since 1961, flow releases from Iron Gate Dam were higher than the flows during the September 2002 fish kill. Two of the years where lower flows were recorded during September at KIG occurred during the drought of the early 1990s. Without looking at the long term flow records, it is inappropriate to use these years to characterize "normal" flow conditions in the Klamath River.